

ABSTRACT OF THE DISCLOSURE

Polymer fiber interconnects are produced between microscale features on substrate using only electrostatic forces. In one embodiment, electric field driven directed growth of fibers is achieved between microscale droplets of a concentrated polymer solution deposited on a substrate associated with a capacitor, such as an interdigitated capacitor. After depositing the droplets, the droplets on or near the positive electrode become positively charged and the droplets on or near the negative electrode become negatively charged. Fibers form between the positively and negatively charged droplets due to electrostatic forces. In a second embodiment, positively charged and negatively droplets are created by electrospraying or by other means, and the fibers spontaneously form between droplets of opposite polarity. The process is similar to conventional electrospinning, but is achieved on a microscopic scale and utilizes significantly lower driving potentials.